

WHAT IS CLAIMED IS:

1. A method of modifying fluid flow in a channel formed in a substrate which comprises:

exposing a portion of the channel to light at a fluence which is sufficient to <sup>And, wavelengths</sup> ~~change a~~ surface charge at the exposed portion of the channel. <sup>Are</sup>  
~~Alter the~~

2. A method of modifying fluid flow in a channel formed in a substrate according to claim 1, wherein the fluence does not cause ablation of the substrate.

3. A method of modifying fluid flow in a channel formed in a substrate according to claim 1, wherein the fluence causes ablation of the substrate.

4. A method of modifying fluid flow in a channel formed in a substrate according to claim 1, wherein the portion of the channel which is exposed to light comprises at least one of a wall of the channel, a bottom of the channel, and portions thereof. <sup>A top of the channel,</sup>

5. A method of modifying fluid flow in a channel formed in a substrate according to claim 1, wherein the channel is linear.

6. A method of modifying fluid flow in a channel formed in a substrate according to claim 1, wherein the channel is non-linear.

7. A method of modifying fluid flow in a channel formed in a substrate according to claim 1, wherein the portion of the channel is exposed to at least one of a linear and non-linear pattern of light.

8. A method of modifying fluid flow in a channel formed in a substrate according to claim 1, wherein the substrate is a member selected from the group consisting of polymeric, glass, silica, ceramic, or composites thereof.

9. A method of modifying fluid flow in a channel formed in a polymeric substrate according to claim 1, wherein the substrate is selected from the group consisting of a poly(methyl methacrylate) substrate, a polycarbonate substrate, a poly(ethylene terephthalate glycol) substrate, a polystyrene substrate, and a poly(vinyl chloride) substrate.

10. A method of modifying fluid flow in a channel formed in a substrate according to claim 1, wherein the substrate comprises a microfluidic system.

11. A method of immobilizing a chemical species in a channel formed in a substrate which comprises:

exposing a portion of the channel to light at a fluence which is sufficient to <sup>And wavelength(s)</sup> ~~change~~ <sup>Alter the</sup> a surface charge at the exposed portion of the channel; and <sup>Are</sup>

applying a chemical species to the exposed portion of the channel.

12. A method of immobilizing a chemical species in a channel formed in a substrate according to claim 11, wherein the chemical species comprises a chemical compound.

13. A method of immobilizing a chemical species in a channel formed in a substrate according to claim 11, wherein the chemical species comprises a biological species.

14. A method of immobilizing a chemical species in a channel formed in a substrate according to claim 11, wherein the portion of the channel that is exposed to the light comprises at least one of a wall of the channel, a bottom of the channel, <sup>A top of the channel,</sup> and portions thereof.

15. A method of immobilizing a chemical species in a channel formed in a substrate according to claim 11, wherein the substrate is a member selected from the group consisting of polymeric, glass, silica, ceramic, or composites thereof.

16. A method of immobilizing a chemical species in a channel formed in a polymeric substrate according to claim 11, wherein the substrate is selected from the group consisting of a poly(methyl methacrylate) substrate, a polycarbonate substrate, a poly(ethylene terephthalate glycol) substrate, a polystyrene substrate, and a poly(vinyl chloride) substrate.

17. A method of immobilizing a chemical species in a channel formed in a substrate according to claim 11, wherein the substrate comprises a microfluidic system.

18. A method for immobilizing a chemical species in a channel formed in a substrate according to claim 17, wherein a microarray is formed in the microfluidic system.

19. In a microfluidic system comprising a substrate having a fluid flow channel, the improvement comprising a portion of the fluid flow channel which has been surface-charged modified by exposure to light.

20. The microfluidic system according to claim 19, wherein the fluid flow channel has at least one linear or non-linear portion which has been surface-charged modified by exposure to light.

21. The microfluidic system according to claim 19, wherein the portion of the fluid flow channel which has been surface modified by exposure to light has not been ablated by the exposure to light.

22. The microfluidic system according to claim 19, wherein the portion of the fluid flow channel which has been surface modified by exposure to light has been ablated by the exposure to light.

23. The microfluidic system according to claim 22, wherein a chemical compound or biological species is immobilized at the modified portion of the fluid flow channel.

24. The microfluidic system according to claim 21, wherein a chemical compound or biological species is immobilized at the modified portion of the fluid flow channel.

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